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# **BENEFITS REALIZATION FROM ERP SYSTEMS: THE ROLE OF CUSTOMIZATION**

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## **Abstract**

*Organizations are making large investments in package based Enterprise Resource Planning (ERP) systems. While some organizations have achieved business improvement from their ERP systems, many still fail to realize the benefits identified at the project outset. One recommended approach to improve the likelihood of ERP system success and thereby delivery of benefits, is to avoid package customization. However, it appears that implementing a truly 'vanilla' system, although desirable, is rarely achieved. The type of customization may also be important in influencing the level of benefits realized from ERP systems. A more tailored system may provide a better fit with organizational processes and increased chances of benefit realization. Research that explores the relationship between ERP system customization and benefits realization is lacking. This study helps to fill this gap using an existing benefits management framework explicitly examining the role of customization in ERP projects. The research method will be exploratory research interviews followed by two in-depth case studies. It is anticipated that investigating the role of customization will significantly advance our understanding of the benefits realization process from ERP system projects.*

**Keywords:** *Enterprise Resource Planning, Customization, Benefits Realization, Benefits Dependency Network*

# 1 Introduction

Organizations are making large investments in package based Enterprise Resource Planning (ERP) systems. Investments in ERP systems are normally justified on the basis of likely benefits the system will deliver to the organization. Implementing ERP systems can improve the transparency of business processes, provide better supply chain management and enhance financial control of the organization (Davenport et al., 2002). However, while some organizations have achieved a degree of business improvement from their ERP implementations, there remain many examples of ERP systems failing to realize the full range of benefits identified at the project outset. For example, Barker et al. (2003) describe how a major soft drink bottler's ERP system was intended to provide the benefit of integrated communication, but once live was considered a hindrance to the overall business. Consequently, there remains a need for further research to examine the process of benefits realization from ERP systems.

One recommended approach to improve the likelihood of ERP system success and thereby delivery of benefits, is to avoid package customization (Parr and Shanks, 2000). Taking a 'vanilla' approach has been argued to be beneficial because it reduces problems with future upgrades and reduces implementation and maintenance costs (Brehm et al., 2001). However, research shows that ERP systems are rarely installed without some customization (Gargeya and Brady, 2005). For example, many organizations will customize their systems because of either a mismatch between organizational practices and ERP package functionality or to maintain practices that provide an advantage over competitors (Light, 2005). It appears that implementing a truly 'vanilla' system, although desirable, is rarely achieved. The type of customization may also be important in influencing the level of benefits realized from ERP systems. For example, Light (2005) reports of a customization that enabled the provision of a new production progress reporting screen which reduced production errors from 17% to 8%, a key business benefit. Hence, a better understanding of the role of customization in ERP implementations may provide a significant improvement in benefits being realized from ERP systems.

The overall aim of this research is to examine the relationship between the type of ERP customization and the benefits derived from the system. More specifically, this study seeks to address the following research questions: (1) What type of customization is undertaken for contemporary ERP system implementations? (2) What effect does the type of customization have on the benefits realized from the ERP system implementations? In the following research in-progress paper, the research background provides a short review of, prior ERP research, ERP customization and benefits realization. Against this background, the research gaps are identified. We subsequently introduce our methodological approach to address the proposed research questions and explain the impact we anticipate from our research.

## 2 Research Background

### 2.1 Prior ERP Research

In their comprehensive review of the ERP literature, Schlichter and Kraemmergaard (2010) found previous ERP studies have focused on eight areas of concern: implementation, optimisation and post-implementation, management and organization, the ERP tool, supply chain management and ERP, studying ERP, education and training, and the ERP market and industry. Our study builds on a number of these areas. First, regarding ERP implementation, Parr and Shanks (2000) study the most appropriate strategy for implementation and advocate the partition of ERP projects into several smaller, simpler projects as 'vanilla' implementations. Second, regarding post-implementation, Staehr (2010) investigated which business benefits of ERP systems evolve during the post-implementation period and found that managerial agency was particularly important in the delivery of benefits. Third, regarding the management and organizational change, Rikhardsson and Kraemmergaard (2006) have found that implementing an ERP system can precipitate a number of organizational impacts, such as coordination of accounting processes, integration of business processes, and maintaining the organization's competitive position. Fourth, regarding the ERP tool, Volkoff (2003) has reported on the challenges organizations face when deciding whether an ERP system should be customized to fit with existing organizational processes or whether the ERP structure should be enforced on the

organization. These studies demonstrate that many organizations are faced with significant challenges when undertaking ERP projects, such as whether to attempt to follow a vanilla implementation strategy or to customize the system to reflect current organization processes, and how to manage the organizational impacts from the ERP system to deliver benefits such as improved coordination and integration. However, while each of these aspects has been studied in relation to ERP systems few studies consider them in relation to the delivery of benefits. In particular, very few studies have examined whether benefits realization varies by the type of customization undertaken. Examining this relationship may be useful as it may explain why some implementations are more successful in realizing benefits than others. For example, a more tailored system may provide a better fit with organizational processes and hence increase the chance of benefits being realized.

## 2.2 ERP Package Customization

According to Luo and Strong (2004), customization is a process that involves the alteration of an ERP system to match the organization's existing business processes. A contrasting, less process orientated perspective is taken by Light (2001) who considers customization as an activity that makes changes or additions to the functionality already available in the standard ERP software. A third view of customization is presented by Davenport (1998) who describes that at the time of ERP implementation, organizations first choose which modules to install. Organizations then undertake table configurations to achieve the best fit with organizational processes. By contrast to the previous views, Davenport (1998) considers customization only in terms of table configuration, alongside wider module customization. Consequently, it is clear that there is a lack of consistency in how the term customization is interpreted and conceptualised in the existing literature. This lack of consistency is also apparent in other aspects of previous ERP studies. For example, several authors have developed different ERP customization typologies (Davenport, 1998; Brehm et al., 2001; Luo and Strong, 2004). A summary of these typologies is presented in figure 1. Although, there is some consistency between the typologies developed by Davenport (1998) and Luo & Strong (2004), several inconsistencies and contrasting interpretations are apparent across all three typologies. For example, Brehm et al. (2001)'s typology includes workflow programming. To write industry workflows, may require code modification that is a separate category in the typology presented by Luo and Strong (2004). Therefore, it is not clear whether this customization should be categorised as workflow programming or core code customization. An additional weakness in these existing typologies is that they may no longer reflect the more sophisticated functionality and internal architecture of contemporary ERP systems. Also, they do not take into account recent developments such as service-oriented architectures and cloud computing. Therefore, there is a need to re-examine our understanding of customization in relation to ERP systems and the potential to enhance typologies of ERP customizations.

Davenport (1998)	Luo and Strong (2004)	Brehm et al. (2001)
1. Configuring Modules	1. Module Customization	1. Configuration
2. Configuring Tables	2. Table Customization	2. Bolt-ons
	3. Code Customization	3. Screen masks
		4. Extended reporting
		5. Workflow programming
		6. User exits
		7. ERP programming
		8. Interface development
		9. Package code modification

Figure 1: Typologies of ERP Customizations

Light (2001) reports that ERP customization can lead to a variety of benefits such as adding functionality, process automation and the provision of new reports. Chou and Chang (2008) report that ERP customization has a significant influence over intermediate and overall benefits derived from the system. They also found that achieving organizational alignment through functional customization provided a better improvement in ERP benefits than achieving organizational acceptance of alignment or process adaptation. Similarly, Gattiker and Goodhue (2005) found that ERP customization could improve local efficiency and intermediate benefits for manufacturing plants. However, although these

studies establish a link between ERP customization and benefits they do not consider the influence of the type of ERP customization undertaken or how this influence is manifested. Consequently, it is important to explore how ERP customization may fit into existing models and frameworks for managing the entire benefits management process.

## 2.3 Benefits Management

Benefits management (BM) has been defined as ‘the process of organizing and managing, such that the potential benefits arising from the use of IT are actually realized’ (Ward & Elvin, 1999). Several studies have attempted to develop models and frameworks to manage the entire benefits management process that include: the Cranfield Process Model of Benefits Realization (Ward et al., 1996); the Active Benefit Realization (Remenyi et al., 1997) and the Model of Benefits Identification (Changchit et al., 1998). However, despite the availability of these tools it appears that many organizations have been unable to translate them into effective working practices. A recent survey of benefits management practices reports that only a minority of responding organizations had adopted a comprehensive approach to managing benefits from their IS/IT investments (Ward et al., 2007). This evidence led Ashurst et al. (2008) to conclude that benefits realization remains a good example of the frequent gap between management theory and practice.

The BM technique we chose to adopt for this study was the Cranfield Process Model of Benefits Realization (Ward et al., 1996). This model is one of the most well known and is widely cited in the BM literature (Braun et al., 2009). The central element of the Cranfield model is the Benefits Dependency Network (BDN). The BDN is a framework that is designed ‘*to enable the investment objectives and their resulting benefits to be linked in a structured way to the business, organizational and IS/IT changes required to realize those benefits*’ (Ward and Daniel, 2006: 133). The network, shown in Figure 2 is created from right to left, with agreement on the *investment objectives* for the IS development project and identification of the expected *business benefits* associated with these objectives. Each benefit is then considered in turn and the changes necessary to realize the benefit are then identified. Two types of changes may be required. *Business changes* are permanent new ways of working that are required to ensure that the desired benefit is achieved and can be sustained. *Enabling changes* are prerequisites for achieving the business changes or may be essential to bring the system into effective operation within the organization. These enabling changes may only be required to be performed once. Finally, the information technology or systems have to be considered. The required *IS/IT enablers* are identified to support the realization of anticipated benefits and allow the necessary changes to be undertaken. For example, IS/IT enablers may include the functionality of process control, production planning, billing or finance (Ward and Daniel, 2006). We postulate that customization can influence the benefits dependency network at two points. Firstly, customization may be necessary to modify the IS/IT enablers before ERP implementation. These customizations may be necessary to ensure that the system meets the functional requirements of the organization. For example, the UK water industry has two main billing mechanisms. Some households are billed on their metered water usage. However, many households do not have a water meter and are billed on the basis of the rateable value of the home. The latter mechanism is unique to the UK water industry, so is unlikely to be included in standard ERP billing functionality, but would need to be included to meet the needs of water companies. Secondly, customization may occur after the IS/IT enablers have been implemented. For example, having implemented billing functionality, it may become apparent that the presentation layout of customer bills is not clear. Consequently, further customization may be required to adjust the format of customer bills to deliver the benefit of improved customer satisfaction. This path is illustrated in Figure 2 as a feedback arrow from business change to customization.

To date there has been very little empirical investigation of what organizations are doing in practice to manage benefits from their IS/IT investments (Doherty et al., 2012). Consequently, there is an urgent need for new interpretive contributions that present insights into how benefits oriented practices might best be operationalized and incorporated into systems development projects and project reviews.

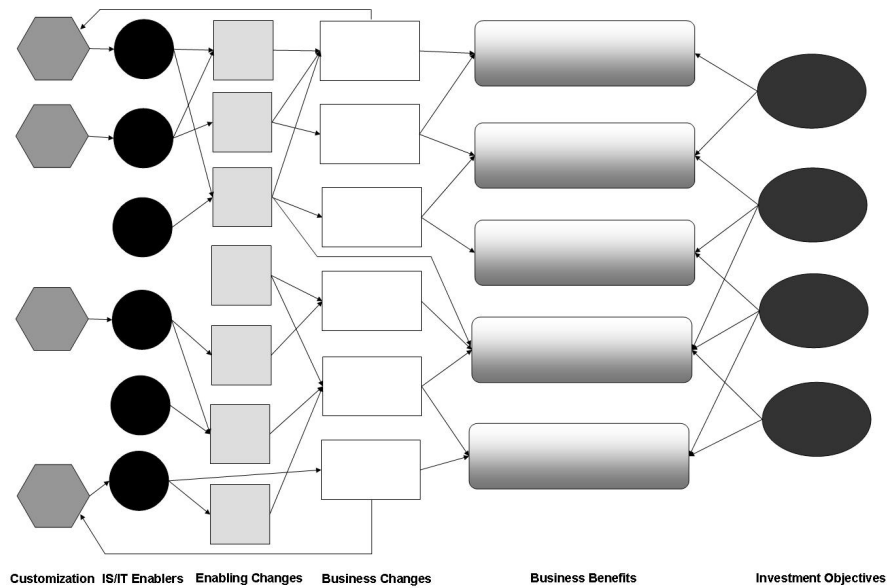


Figure 2: Benefits Dependency Network Including Customization

## 2.4 Research Gap on Benefits Realization from Customized ERP Systems

The high investment in ERP systems means that realizing benefits from these implementations are of critical importance to many organizations. Yet, the delivery of benefits from many ERP implementations remains disappointingly low. It has been reported that almost 85% of ERP implementations undergo some type of customization (Panorama Consulting Group, 2011). Several studies have examined ERP customization (e.g. Light, 2001) and other researchers have examined the benefits that can be delivered from ERP implementations (e.g. Staehr, 2010). Wider research has also been undertaken to better understand the benefits management process (e.g. Ward et al., 2007). So while there is evidence from previous research that benefits are delivered from some ERP implementations, the lack of consistent successful delivery of these benefits suggests that the process of achieving benefits is not completely understood. Similarly, although, we know from previous studies why it is sometimes necessary to customize an ERP system and how a system can be customized (Brehm et al., 2001), it is not clear whether or not these customizations lead to improved realization of benefits. Existing studies suggest that there may be a link between ERP customization and the benefits (Light, 2005). However, they do not consider the influence of the type of ERP customization undertaken. Consequently, it is important to explore how ERP customization may fit into existing models and frameworks for managing the entire benefits management process. This study will address this gap by investigating the types of customization of ERP systems. These insights will then be considered in terms of the relationship between customization type and the realization of benefits from ERP investments.

## 3 Research Methods

The research adopted a multi-phase approach to data collection using an initial exploratory stage before commencing a more detailed case study investigation. This approach was adopted because when attempting to operationalize the research questions a number of practical issues were identified that required attention before the main research was conducted. First, as has been shown in section 2.2 there is inconsistency in the literature regarding the definition and classification of different types of customization. Second, section 2.3 demonstrates there is a limited amount of literature that has studied the process of benefits realization for systems development projects in general and for ERP systems in particular. These practical issues presented a strong argument for conducting some exploratory research in order to further develop and refine the terms of reference for the research project.

In the first exploratory phase, a semi-structured interview approach was adopted. The interview guide was developed based on the limited existing literature on ERP customizations and benefits

management. The ERP industry can be broadly categorised into three main groups, the vendors that supply the ERP software, the system integrators that facilitate the implementation of the software in organizations and the client organizations themselves. Consequently, potential interviewees were approached from all three stakeholder groups and in total 17 interviews were conducted: vendors (7 interviewees); system integrators (4 interviewees); client organizations (6 interviewees). Senior representatives were selected from each stakeholder group to understand their experiences of ERP customizations and benefits realization. Each interview lasted from 45 to 90 minutes and consent was obtained to record each interview. The interviewees were contacted via e-mail for a series of follow-up questions during the analysis. At the time of writing, the analysis of the exploratory data is being undertaken. The analysis is following the three parallel activities of data reduction, data display and conclusion drawing with verification (Miles and Huberman, 1994). Both deductive and inductive approaches will be used for the analysis and coding of the data. Initially, deductive approach will be applied to code the data using the codes related to the research questions and concepts being examined. Because of the exploratory nature of the research, an inductive analysis technique will also be used to allow unexpected findings to emerge from the data and the coding framework can be revised and modified. N'Vivo software is being adopted to facilitate the data coding process. The data will then be presented in a series of conceptually ordered displays in order to study the related concepts in more depth and generate more explanatory power.

In the second phase, two in-depth case studies will be conducted to further explore the research questions in greater detail. The organizations will be selected to provide contrasting experiences of ERP customization (Yin, 1994). Two organizations from the UK utility industry have agreed to participate in the research. These companies are similar in size in terms of employees and customer base. In addition, although, both companies supply their products on a metered basis to UK households but both also have to accommodate some alternative legacy billing methods e.g. billing based on rateable value, or pre-payment meters. Both sites have implemented the same ERP software, with variation in the type of customisation undertaken. Interviews have been arranged at both sites. In case study A, seven interviews are planned including the ERP Programme Manager, Finance and Metering Managers, and Benefits Realization Managers. In case study B, six similar interviewees have been identified including the IT Programme Managers, Service Delivery Manager, Field Service Team Manager and Director of Metering. The interview guide for the second stage will be informed by the literature and the findings of the exploratory research. It is envisaged that this case study approach will enrich our understanding of different types of customization and their related impact on the process of benefits realization from ERP systems.

## **4 Anticipated Contribution**

The study will provide important new contributions in understanding the relationships between the types of customization in ERP systems and realization of benefits from these systems. A combined benefits management and customization approach has not been examined empirically in relation to ERP systems. Therefore, this research will help fill this gap and develop a framework linking ERP customization types to benefits realized from the ERP implementation. Understanding this process will enable organizations to be more effective and efficient when adopting or updating ERPs and thereby deliver superior services both internally and externally. In turn, this should increase the likelihood of getting the best return from ERP investments.

## **References**

- Ashurst, C., Doherty, N.F. and Peppard, J. (2008). Improving the impact of IT development projects: the benefits realization capability model, *European Journal of Information Systems*, 17, 352-370.
- Barker, T. and Frolick, M.N. (2003). ERP implementation failure: a case study. *Information Systems Management*, 20(4), 43-49.
- Braun, J., Ahlemann, F. and Riempp, G. (2009). Benefits Management – A Literature Review and Elements of a Research Agenda, *Wirtschaftsinformatik Proceedings*, Paper 54.

- Brehm, L., Heinz, A. and Lynne, M.L. (2001). Tailoring ERP Systems: A Spectrum of Choices and their Implications, Proceedings of the 34th Hawaii International Conference on System Sciences, Hawaii, USA.
- Changchit, C., Joshi, K. D. and Lederer, A. L. (1998). Process and reality in information systems benefit analysis. *Information Systems Journal*, 8(2), 145-162.
- Chou, S.W. and Chang, Y.W. (2008). The implementation factors that influence the ERP (enterprise resource planning) benefits, *Decision Support Systems*, 46, 149-157.
- Davenport, T., Harris, J. and Cantrell, S. (2002). *The Return of Enterprise Solutions*, Accenture.
- Davenport, T.H. (1998). Putting the enterprise into the enterprise system, *Harvard Business Review*, 76, 121-131.
- Doherty N.F., Ashurst, C. and Peppard, J. (2012). Factors affecting the successful realization of benefits from systems development projects: findings from three case studies. *Journal of Information Technology*, 27, 1-16.
- Gargeya, V.B. and Brady, C. (2005). Success and failure factors of adopting SAP in ERP system implementation, *Journal of Business Process Management*, 11(5), 501-516.
- Gattiker, T.F. and Goodhue, D.L. (2005). What Happens after ERP Implementation: Understanding the Impact of Interdependence and Differentiation on Plant-Level Outcomes, *MIS Quarterly*, 29(3), 559-585.
- Light, B. (2001). The maintenance implications of the customization of ERP software, *Journal of Software Maintenance and Evolution: Research and Practice*, 13, 415-429.
- Light, B. (2005). Going beyond 'misfit' as a reason for ERP package customization, *Computers in Industry*, 56, 606-619.
- Luo, W. and Strong, D.M. (2004). A Framework for Evaluating ERP Implementation Choice, *IEEE Transactions on Engineering and Management*, 51(3), 322-333.
- Miles, M.B. and Huberman, A.M. (1994). *Qualitative Data Analysis: An Expanded Sourcebook*. 2nd Edition. Sage Publications. London
- Panorama Consulting. (2011) ERP Report: A Panorama Consulting Group Research Report. Online <http://panorama-consulting.com/Documents/2011-ERP-Report.pdf>. Accessed 25/10/2011.
- Parr, A. and Shanks, G. (2000). A Model of ERP Project Implementation, *Journal of Information Technology*, 15 (4), 289-303.
- Reymeni, D., Sherwood-Smith, M. and White, T. (1997). *Achieving Maximum Value from Information Systems: A Process Approach*, John Wiley & Sons: Chichester.
- Rikhardsson, P. and Kraemmergaard, P. (2006). Identifying the impacts of enterprise system implementation and use: examples from Denmark, *International Journal of Accounting Information Systems*, 7 (1), 36-49.
- Schlichter, B.R. and Kraemmergaard, P. (2010). A comprehensive literature review of the ERP research field over a decade, *Journal of Enterprise Information Systems*, 23, 4, 486-520.
- Staehr, L. (2010). Understanding the role of managerial agency in achieving business benefits from ERP systems, *Information Systems Journal*, 20 (3), 213-38.
- Volkoff, O. (2003). Configuring an ERP system: introducing best practices or hampering flexibility?, *Journal of Information Systems Education*, 14(3), 319-24.
- Ward, J., Taylor, P. and Bond, P. (1996). Evaluation and Realization of IS/IT Benefits: An empirical study of current practice, *European Journal of Information Systems*, 4, 214-255.
- Ward, J. and Elvin, R. (1999). A new framework for managing IT-enabled business change. *Information Systems Journal*, 9 (3), 197-222.
- Ward, J. and Daniel, E. (2006). *Benefits Management: Delivering Value from IS & IT Investments*, John Wiley & Sons: Chichester.
- Ward, J., Hertogh, S.D. and Viaene, S. (2007). Managing Benefits from IS/IT Investments: an Empirical Investigation into Current Practice, Proceedings of 40th Hawaii International Conference on Information Systems.
- Yin, R. K. (1994). *Case Study Research: Design and Methods*, (2nd ed.), London: Sage Publications.